CLAIMS:

1. In a machine for conditioning crop materials, the improvement comprising:

a front pair of mutually oppositely rotatable, non-compressible surface rolls adapted to receive a stream of crop materials, condition the materials as they pass between the rolls, and feed the materials rearwardly,

each of said front rolls being provided with a set of generally radially outwardly projecting, elongated ribs extending generally helically along the length of the roll,

the ribs of one front roll being adapted to intermesh with the ribs of the other front roll;

a rear pair of mutually oppositely rotatable, compressible surface rolls disposed to receive crop materials from the front rolls and subject the crop to a further conditioning action,

each of said rear rolls being provided with a set of generally radially outwardly projecting, elongated bars extending generally helically along the length of the roll,

the bars of one rear roll being adapted to intermesh with the bars of the other rear roll,

the rolls of each pair of rolls being relatively movable toward and away from one another; and

tension mechanism operably coupled with the front and rear pairs of rolls in a manner to resist said relative movement of the rolls of each pair away from one another.

2. In a machine as claimed in claim 1,

further comprising adjustable stop structure disposed for adjustably limiting relative movement of the rolls of each pair toward one another.

3. In a machine as claimed in claim 2,

only one roll of each pair being movable toward and away from the other roll of the pair.

4. In a machine as claimed in claim 1,

said tension mechanism including hydraulic cylinders connected in a hydraulic circuit.

5. In a machine as claimed in claim 4,

said hydraulic circuit including valving operable when closed to trap pressurized hydraulic fluid within the cylinders.

6. In a machine as claimed in claim 5,

said valving being operable when opened to allow charging of the hydraulic cylinders with pressurized hydraulic fluid to a selected pressure level or discharging of hydraulic fluid from the cylinders to a selected pressure level.

7. In a machine as claimed in claim 5,

said hydraulic circuit further including a compressible gas accumulator connected in flow communication with the hydraulic cylinders to provide a cushioning effect.

8. In a machine as claimed in claim 1,

said tension mechanism being operable to adjust the tension force on the front rolls independently of the tension force on the rear rolls.

9. In a machine as claimed in claim 8,

the rolls of the front pair being relatively movable toward and away from one another independently of the rolls of the rear pair.

10. In a machine as claimed in claim 1,

the rolls of the front pair being relatively movable toward and away from one another independently of the rolls of the rear pair.

11. In a machine as claimed in claim 1,

said front and rear pairs of rolls presenting a pair of upper rolls and a pair of lower rolls,

one of the upper rolls being fixed and the other upper roll being mounted for pivoting movement about the axis of rotation of the fixed upper roll,

one of the lower rolls being fixed and the other lower roll being mounted for pivoting movement about the axis of rotation of the fixed lower roll,

the movable upper roll being pivotal toward and away from the fixed lower roll, and the movable lower roll being pivotal toward and away from the fixed upper roll.

12. In a machine as claimed in claim 11,

said tension mechanism including a pair of hydraulic cylinders operably coupled with respective ones of the movable rolls,

each of said hydraulic cylinders being connected in a hydraulic circuit that includes valving operable when closed to trap pressurized hydraulic fluid within a corresponding cylinder,

said valving being operable when open to allow charging of the hydraulic cylinders with pressurized hydraulic fluid to a selected pressure level or discharging of hydraulic fluid from the cylinders to a selected pressure level,

each of said cylinders having its own valving operable independently of the valving for the other cylinder.

13. In a machine as claimed in claim 12,

each of said hydraulic cylinders having a compressible gas accumulator connected in fluid flow communication with the cylinder to provide a cushioning effect for the cylinder.

14. In a machine as claimed in claim 1,

said front rolls being constructed from metal.

15. In a machine as claimed in claim 1,

said rear rolls being constructed from a group of materials consisting essentially of rubber, neoprene, and elastomer.

16. In a machine as claimed in claim 15,

said front rolls being constructed from metal.

17. In a machine for conditioning crop materials, the improvement comprising:

at least one pair of oppositely rotatable rolls for acting upon a stream of crop materials passing between the rolls,

said rolls being relatively movable toward and away from one another; and

tension mechanism operably coupled with the rolls for supplying a tension force resisting movement of the rolls away from one another,

said tension mechanism including a hydraulic cylinder connected in a hydraulic circuit.

18. In a machine as claimed in claim 17,

said hydraulic circuit including valving operable when closed to trap pressurized hydraulic fluid within the cylinder.

19. In a machine as claimed in claim 18,

said valving being operable when opened to allow charging of the hydraulic cylinder with pressurized hydraulic fluid to a selected pressure level or discharging of hydraulic fluid from the cylinder to a selected pressure level.

20. In a machine as claimed in claim 19,

said hydraulic circuit further including a compressible gas accumulator connected in flow communication with the hydraulic cylinder to provide a cushioning effect.

21. In a machine as claimed in claim 17,

further comprising a second pair of oppositely rotatable rolls movable relatively toward and away from one another and disposed to receive crop materials from the first-mentioned pair of rolls for acting upon such materials as they pass between the second pair of rolls,

said tension mechanism being operably coupled with said second pair of rolls for resisting movement of the second pair of rolls relatively away from one another.

22. In a machine as claimed in claim 21,

said tension mechanism including a second hydraulic cylinder coupled with said second pair of rolls,

said first-mentioned hydraulic cylinder and said second hydraulic cylinder each having valving adapted to trap pressurized fluid in the cylinders,

said valving being operable to permit fluid to be trapped in the first-mentioned cylinder at a different pressure level than fluid trapped in said second cylinder.

23. In a machine as claimed in claim 22,

said first-mentioned rolls comprising a pair of non-compressible surface rolls, each having a set of generally radially outwardly projecting ribs that extend generally helically along the length of the roll,

said second rolls comprising a pair of compressible surface rolls, each having a set of generally radially outwardly projecting bars that extend generally helically along the length of the roll.

24. A method of conditioning crop materials comprising the steps of:

presenting crop materials to a front pair of oppositely rotating, non-compressible surface rolls having intermeshing ribs that extend generally helically along the respective lengths of the rolls;

passing the crop materials between the front rolls while the rolls are under tension to condition the materials;

presenting the conditioned materials from the front rolls to a rear pair of oppositely rotating, compressible surface rolls immediately behind the front rolls,

said rear rolls having intermeshing bars that extend generally helically along the respective lengths of the rear rolls; and

passing the conditioned crop materials between the rear rolls while the rear rolls are under tension to subject the conditioned materials to a further conditioning action.

25. A method as claimed in claim 24,

wherein the rear rolls are set at a tension that is higher than, lower than, or substantially the same as the tension on the front rolls.

26. A method as claimed in claim 24,

wherein the tension force is applied hydraulically to the front rolls and the rear rolls.

27. A method as claimed in claim 24,

further comprising the step of adjusting the tension on the front rolls independently of the tension on the rear rolls.

28. A method as claimed in claim 24,

further comprising the step of adjusting spacing between the front rolls independently of adjusting spacing between the rear rolls.

29. In a machine for conditioning crop materials, the improvement comprising:

a front pair of mutually oppositely rotatable, non-compressible surface rolls adapted to receive a stream of crop materials, condition the materials as they pass between the rolls, and feed the materials rearwardly;

a rear pair of mutually oppositely rotatable, compressible surface rolls disposed to receive crop materials from the front rolls and subject the crop to a further conditioning action before projecting the conditioned materials rearwardly,

the rolls of each pair of rolls being relatively movable toward and away from one another;

adjustable stop structure disposed for adjustably limiting relative movement of the rolls of each pair toward one another to present gaps between the rolls; and

tension mechanism operably coupled with the front and rear pairs of rolls in a manner to yieldably bias the rolls of each pair against said stop structure.

30. In a machine as claimed in claim 29,

each of said front rolls being provided with a set of generally radially outwardly projecting, elongated ribs extending generally helically along the length of the roll,

the ribs of one front roll being adapted to intermesh with the ribs of the other front roll.

31. In a machine as claimed in claim 30,

each of said rear rolls being provided with a set of generally radially outwardly projecting, elongated bars extending generally helically along the length of the roll,

the bars of one rear roll being adapted to intermesh with the bars of the other rear roll.